

A NEW SPECIES OF *SILENE* IN THE *SILENE HOOKERI* COMPLEX (CARYOPHYLLACEAE) FROM THE KLAMATH MOUNTAINS OF SHASTA-TRINITY NATIONAL FOREST, TRINITY COUNTY, CALIFORNIA

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ABSTRACT

Silene salmonacea T.W. Nelson, J. P. Nelson and S.A. Erwin is here described as new and illustrated; endemic to the Klamath Mountains of Shasta-Trinity National Forest west of Clair Engle Lake. *Silene salmonacea* is compared with *Silene hookeri* Nutt. and *Silene bolanderi* A. Gray. A key to the three members of the *S. hookeri* complex is included.

Key Words: *Silene*, serpentine, Trinity County, Weaverville Formation, Shasta-Trinity National Forest, Clair Engle Lake, California.

DESCRIPTION

Silene salmonacea T.W. Nelson, J. P. Nelson and S. A. Erwin, sp. nov. (Figs. 1–3). Perennes; rhizomata tenuia ramosa. Ad radicem palarem profundam affixa; caules erecti 5–14 mm longi canescentes; folia congesta, paribus 3–4, spathulati-oblancoolata, 25–35 mm longa, 4–6 (–8) mm lata; inflorescentia terminalis floribus 2–3 (–4); calyx distincte 10 nervatis; corolla limbo salmonaceo in lobos 4 fere equales diviso, unguis viridis basi albus; appendices petaloideae virides vel albae, lineares, 2 in quoque petalo, 1.8–2 mm longae 0.5–1 mm latae; antherae longiexertae; stylus inclusa.

Perennial; stems 5–14 mm long; erect from thin branching rhizome system arising from deep, thickened tap root, gray-green, canescent; cauline leaves 3–4 pairs, crowded, spathulate to oblanceolate, 25–35 mm long, 4–6 (–8) mm wide, gray-green, the lowest much reduced in size; inflorescence terminal, 2–3 (–4) flowered; calyx gray-green, canescent, distinctly 10 nerved, 18–23 mm long, teeth ciliate, lanceolate, 4–7 mm long, expanding in fruit; limb of corolla salmon-orange colored (Fig. 3), palmately partite into 4 nearly equal obtuse lobes, the lobes 8–10 mm long, inner 2 lobes 2.4–2.5 mm wide, the outer 2 lobes 1.75–2 mm wide, the limb considerably wider than claw; claw glabrous, green becoming white at base; petal appendages 2, linear, 1.8–2 mm long, 0.5–1.0 mm wide, light green to white, contrasting with salmon colored limb; filaments 16–17 mm long, long exerted; styles 3, ca. 9 mm long, included; ovary 4 mm long, green; seeds reniform, reddish-brown, 2.18 × 1.5 mm, strongly papillate, the papillae in parallel rows (Fig. 2).

Type: USA, CA, Trinity County, T36N R8W sect. 22 SE ¼ NW ¼. UTM 4534856N 0519803E. Elev. 1043 m (3421 ft). Shasta-Trinity National Forest. NW of Forest Service Road 36N25 (County Road 123) ca. ¼ mile NW from bridge over Cement Creek. Serpentine hillside recently disturbed by logging. 3 June 2004. *T. W. Nelson & S. A. Erwin 9218* (HOLOTYPE: HSC; Isotypes: CAS, RM, UC, MO, MICH.)

Paratypes: USA, CA, Trinity County: T36N R8W sect. 22 SE ¼ NE ¼. Elev. 1020 m (3400 ft). About 400 m NW of crossing of Cement Creek by Forest Service Rd. 36N25. 4 June 2002. *D. W. Taylor 18097*, (HSC); Haylock Ridge above Smith Gulch, Trinity Lake, T34N R9W sects. 1 & 12. 11 June 1978. *S. Horner s.n.* (Shasta-Trinity National Forest Herbarium); T34N R9W sect. 12. UTM 45128106N 0514653E. Elev. 774 m (2580 ft). Along Forest Service Road 34N80 between roads 34N73 & 34N71. Open areas in mixed evergreen forest and road banks. 8 June 2005. *T. W. Nelson & S. A. Erwin 9342* (HSC); T34N R4W sect. 6. UTM 4519536N 0514929E. Elev. 845 m (2815 ft). Along Forest Service Road 34N80 in opening in mixed evergreen woodland. 8 June 2005. *T. W. Nelson & S. A. Erwin 9345* (HSC). Duplicates are to be distributed.

Susan Erwin found two more populations each with less than five plants; so no collections were made. The locations are: Trinity County, west of Clair Engle Lake on the iron rich soil of the Weaverville Formation. T34N R8W sect. 19. Elev. 900 m (2952 ft) at the junction of roads 34N94 & 34N17Y and the other at T34N R9W sect. 9. Elev. 930 m (3066 ft) along road 113.

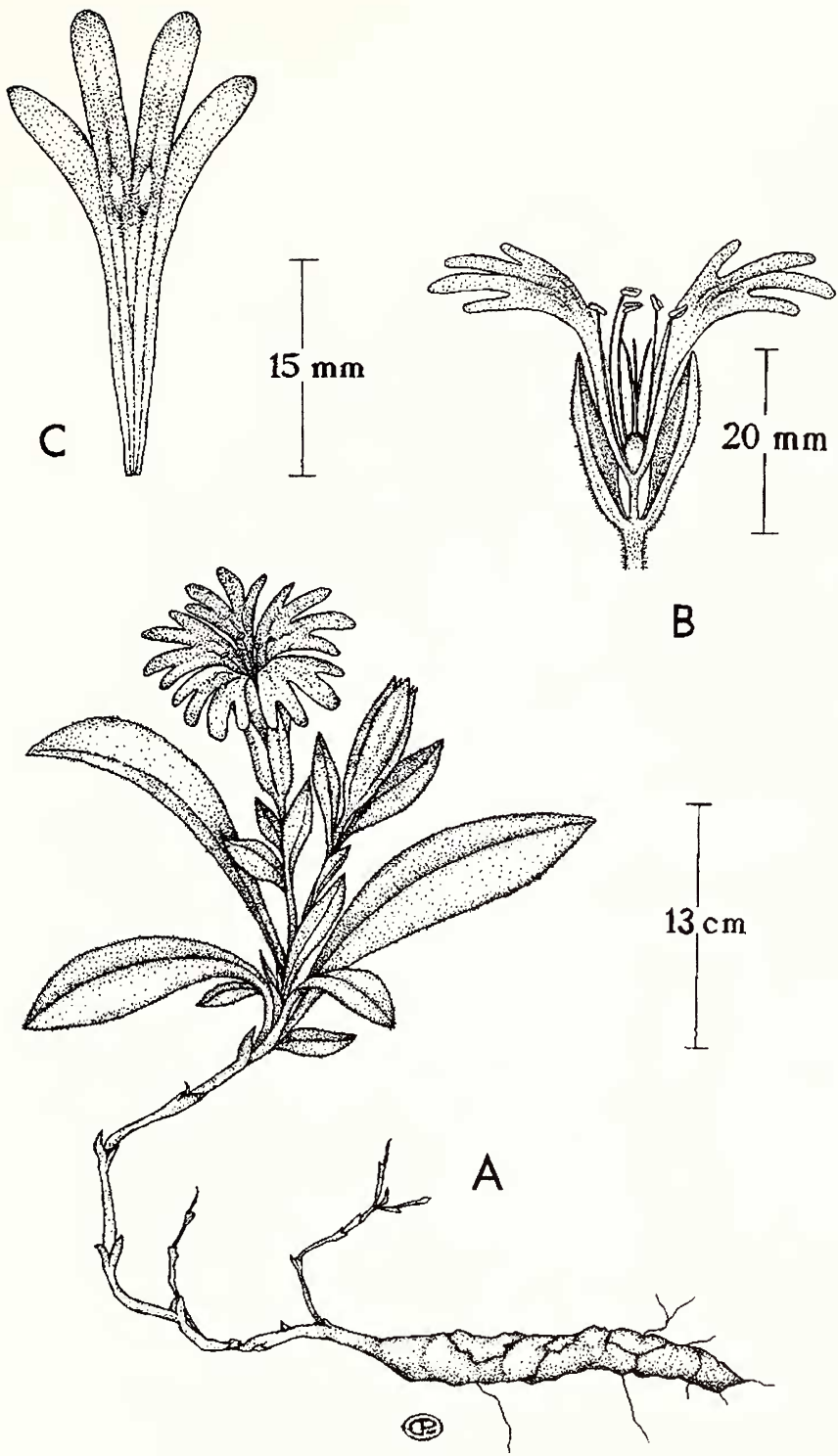


FIG. 1. Illustration of *Silene salmonacea*; A. Mature plant at anthesis. B. Flower in longitudinal section. C. Petal showing appendages.



FIG. 2. Photograph of the seeds of *Silene salmonacea*. Seeds are approximately 2 mm in length.

Silene salmonacea appears to be very rare, as it is only known from the type locality and five other sites. The populations range in number from 3 to 250 plants. It has been found on serpentine soils and the iron rich soils of the Weaverville Formation of the low hills of the Klamath Mountains west of Clair Engle Lake, where it occurs on either open serpentine or openings in mixed evergreen forests at elevations from 845 to 1043 m.

Incomplete descriptions (often based on a single specimen) have added some confusion to the treatment to the *Silene hookeri* complex. Nuttall (1838) described *Silene hookeri* based on a single specimen collected by Dr. Gardiner, and no type or lectotype has ever been designated. Gray (1868) named *S. bolanderi* but with no mention of its lack of petal appendages. Tidestrom and Dayton (1929) described *S. ingrani* based on a single incomplete specimen. They also failed to describe any petal appendages. Peck (1932) described *S. pulverulenta* based on a single incomplete specimen. His prolog was mostly written in Latin with only a brief commentary in English that included no comments about the petal appendages.

Subsequent to these species descriptions, Abrams (1944) reduced *S. bolanderi* to a subsp.

of *S. hookeri* and *S. ingrani* and *S. pulverulenta* to synonyms of subsp. *hookeri*. In their revision of *Silene*, Hitchcock and Maguire (1947) recognized three subsps. of *S. hookeri*: subsps. *hookeri*, *bolanderi* and *pulverulenta*. Munz and Keck (1959) and Morton (2005) recognized only subsps. *hookeri* and *bolanderi*. Wilken (1993) only recognized a highly variable *S. hookeri*.

During our studies of the *S. hookeri* complex, we concluded that based on the different characters shown in Table 1, *S. bolanderi* should be recognized as a separate species rather than a subspecies of *S. hookeri*. Thus we consider, the *S. hookeri* complex to consist of *S. hookeri*, *S. bolanderi* and *S. salmonacea*. This is also the concept being followed by Hartman (personal communication) in his forthcoming revision for the Jepson Manual.

These three taxa of the *S. hookeri* complex are easily distinguished. *Silene bolanderi* is separated from the other two because it lacks petal appendages and is the only member with white flowers. In addition to differences in petal color, *S. hookeri* can be easily separated from *S. salmonacea* by the fact that the anthers are included while those of *S. salmonacea* are long exserted. Additional details are included in Table 1.



FIG. 3. Photograph of *Silene salmonacea* at type locality.

A KEY TO THE CALIFORNIA *SILENE HOOKERI* COMPLEX

- A. Petal appendages absent; limbs white or tinted green *Silene bolanderi*
 A' Petal appendages 2; limbs pink or salmon-orange
 B. Anthers included, petal lobes either 2 each with a small lateral tooth or 4 and unequal; limb and claw pink adaxially, white abaxially *Silene hookeri*
 B' Anthers excluded, petals with 4 nearly equal parallel lobes; limbs salmon-orange, claws white becoming green at base *Silene salmonacea*

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TABLE 1. MORPHOLOGICAL COMPARISON OF SPECIES IN THE *SILENE HOOKERI* COMPLEX.

	<i>Silene salmonacea</i>	<i>Silene bolanderi</i>	<i>Silene hookeri</i>
Petal colors	Limb salmon-orange, Claw white becoming green at base	Limb and claw both white tinted green	Limb and claw pink adaxially, white abaxially
Lobes of limb	4, equally palmately dissected nearly to base, tip obtuse	4, equally palmately dissected nearly to base, tip acute	2 lobes each with a small lateral tooth or 4 unequal lobes
Petal appendages	2	0	2
Stems	1–2, reclining to erect from thin rhizomes	1–3, erect from thin rhizomes	3–5, reclining from root crown
Anthers	Long exerted	Long exerted	Included

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